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March 25, 2010

Joseph F. LeMay, P.E.
Office of Site Remediation & Restoration
USEPA Region 1
5 Post Office Square Suite 100
Boston, MA 02109-3912

RE: Response to USEPA December 18, 2009 Comments regarding UniFirst & WR Grace's Draft VIA Work Plan, dated October 9, 2009

Dear. Mr. LeMay:

This letter and its attachments are provided on behalf of UniFirst Corporation (UniFirst) and WR Grace & Co. – Conn. (Grace) in response to comments provided by the United States Environmental Protection Agency Region 1 (USEPA) in a letter dated December 18, 2009 (Comment Letter) and at our meeting at USEPA on January 21, 2010. Attached to this letter are three copies of the Vapor Intrusion Assessment Work Plan Revision 1 and the Quality Assurance Project Plan for Vapor Intrusion Assessment for the Wells G&H Superfund Site.

Form K in the attached QAPP indicates "To Be Determined" for the detection limits and <=0.50 for the reporting limits for 1,3-dichlorobenzene, cis-1,2-dichlorobenzene, and isopropylbenzene. Katahdin Analytical Services, the analytical laboratory selected for this project, is currently performing a method detection limit (MDL) study on these three compounds. They have indicated that the MDL study will be completed on approximately April 9, 2010. At that point we will forward you the information regarding the reporting and detection limits for these compounds. Katahdin has indicated that they will be able to reach the necessary limits for these compounds.

General USEPA Comments

A more comprehensive sampling approach is warranted than that proposed in the Work Plan, considering the pattern of shallow groundwater impacts may be irregular due to bedrock fracturing and the action of the extraction well systems in the area. Indications of elevated volatile organic compound (VOC) concentrations in groundwater in the residential neighborhood will require further evaluation, such as additional well installations, sub-slab soil gas sampling, and indoor air sampling.

Response: *As indicated in our responses to specific Comments 3 and 9, UniFirst and Grace have proposed to increase the number of shallow groundwater monitoring locations defined for the Vapor Intrusion Assessment (VIA). Based on discussions at the January 21, 2010, meeting and intervening correspondence, the parties appear to be in agreement that a work plan that includes one round of groundwater sampling at the locations indicated on Figure 1 (attached), that is coordinated with the annual sampling event for the UniFirst and Grace properties, along with a second round of sampling from the off-property VIA wells, meets the project objectives. Coordination of a VIA sampling event with the annual sampling event for the Grace and UniFirst properties requires that the requisite work plans, Quality Assurance Project Plans (QAPPs), and other project documents are approved by USEPA as needed to meet that schedule. Other than*

indoor air and sub-slab vapor testing being conducted separately by UniFirst, at this time UniFirst and Grace do not anticipate that any additional work will be required. As to the conceptual model for "shallow groundwater impacts" posited in the Comment Letter, please see response to Comment 3 below.

Specific Comments

1) **Page 1-4, Section 1.2.** As suggested in the text, the groundwater sampling under this WP should be coordinated with and occur at the same time as the sampling proposed under the Vapor Intrusion Scope of Work (sub-slab soil gas, indoor air, and shallow groundwater sampling from monitoring wells on the UniFirst Source Area Property). In addition, the methodology for sampling existing monitoring wells under this WP and the Vapor Intrusion Scope of Work should be consistent.

Response: *To the extent possible, the groundwater sampling under this Work Plan will be coordinated to occur over similar periods as the work to be conducted at the UniFirst property. However, given the current schedules for the two sets of work, it is unlikely that the first round of indoor air quality and vapor intrusion assessment (IAQA/VI) at UniFirst and the first round of groundwater sampling under this Work Plan can be done concurrently.*

Grace and UniFirst together have developed the attached Revised VIA Work Plan, which includes consistent methodologies for Vapor Intrusion-related work. One QAPP and set of Standard Operating Procedures has been developed for the groundwater sampling and analysis and is also attached for USEPA review and approval.

The methodology for monitoring well integrity testing and development, groundwater sampling, and laboratory analysis described in the attached QAPP will be followed for all such work.

2) **Page 1-4, Section 1.2.** W.R. Grace has also agreed to install three (3) additional multi-level monitoring wells on/by their property: 1) one immediately downgradient of Area 4 (RW22); 2) immediately downgradient of Areas 2 and 3 recovery wells (southeast corner of property); and 3) immediately south of G11 on the Cummings property. It is suggested that these new wells and existing monitoring wells on the property (e.g., G1, G3, G11, G12, G13, G19, G20, G21, G23, G24, G28 and G364) be sampled at the same time as the other monitoring wells in this SOW, if possible.

Response: *To the extent possible the annual sampling of the Grace on-site wells, including the three multi-level wells Grace has proposed to install on/by its property, will be coordinated to coincide with one of the VIA sampling events. However, if the two sampling events do not coincide, the long history of water quality data available from most of the monitoring wells on the Grace property could be used to estimate the groundwater concentrations in the monitoring wells listed above.*

Monitoring wells G11S and G23S usually cannot be sampled as a result of water level lowering in the vicinity of the wells caused by the active pumping on the Grace property.

3) **Section 2.1, Number and Placement of Wells.** Provide six additional monitoring wells to evaluate groundwater quality in the vicinity of the residential neighborhood, as noted below. See attached Figure 1. As noted above, EPA is concerned that the pattern of shallow groundwater impacts might be irregular due to bedrock fracturing and the action of the extraction well systems in the area. Please find attached two figures illustrating non-pumping groundwater flow direction

and potential influence directions from former production wells G&H (overburden), Johnson irrigation well (bedrock), NEP production wells (bedrock), and recovery well UC-22 (bedrock) generally from the W.R. Grace and UniFirst properties.

- UC-22 Potential Influence: Relocate UG13 further north along Washington Street (e.g., north side of Olympia/Washington Street Intersection) where UC-22 may maybe pulling contamination from W.R. Grace's overburden and shallow bedrock. Note: The water table in this area may be situated in the shallow bedrock, considering overburden may be very shallow; hence, UG13 may need to be screened in shallow bedrock to obtain a shallow groundwater sample by the water table.
- Non-Pumping and potential wells G&H, Johnson and NEP influences by W.R. Grace:
  - Install an additional well west of G22 along the west side of Washington Street;
  - Install an additional well on the south side of Dewey Avenue just east of Hobson Avenue;
  - Relocate UG15 shallow monitoring well further west to the northwest corner of the Cumming's building. W.R. Grace shall maintain the installation of their multi-cluster well at the previous UG15 location (center of the north side of Cumming's building), as presented to EPA during the October 6, 2009 presentation; and
  - Suggest collecting shallow groundwater samples from the K-60 and K-55 monitoring well locations.
- Potential Johnson and NEP influences by UniFirst (Note: the water table in this area may be situated in the shallow bedrock, considering overburden may be very shallow; hence, the following additional and relocated monitoring wells may need to be screened in shallow bedrock to obtain shallow groundwater sample by the water table):
  - Install additional well along south side of Olympia Avenue by the east side of Wainwright Avenue;
  - Install additional well along south side of Olympia Avenue by the west side of Hobson Avenue Intersection; and
  - Relocate UG12 approximately 100' further south along Wainwright Avenue.
- Non-pumping and potential wells G&H influence by UniFirst:
  - Install additional well along south side of Olympia approximately 50'east of Oregon Avenue;
  - Install additional well along west side of Marietta Street approximately 150' south of Olympia Avenue; and
  - Relocate UG11 approximately 100' further west along Dewey Avenue.

Response: *USEPA has requested the installation and sampling of six additional groundwater wells in the Dewey Avenue neighborhood and sampling of two previously installed groundwater wells (K60S and K55S) as part of the VIA. The reasoning provided for the request is that "EPA is concerned that the pattern of shallow groundwater impacts might be irregular due to bedrock fracturing and the action of extraction well systems in the area." USEPA attached two unnumbered figures to the Comment Letter illustrating "non-pumping groundwater flow direction and potential influence directions from former production wells," as shown by schematic groundwater flow direction arrows drawn by USEPA on the two figures. The "non-pumping groundwater flow direction" was referred to as the "natural groundwater flow direction" on the two figures. The apparent effects on groundwater flow directions that result from this conceptual USEPA interpretation of "potential influence directions from former production wells" include:*

- *Southerly diversion of shallow groundwater flow beneath the Dewey Avenue neighborhood in response to historic pumping from former City of Woburn public supply Wells G&H (illustrated on the first un-numbered figure);*
- *Southerly diversion of groundwater flow beneath the Dewey Avenue neighborhood in response to historic pumping from deep bedrock wells located at the former Johnson Brothers nursery and the New England Plastics (NEP) property (illustrated on the second un-numbered figure); and*
- *Northwesterly diversion of groundwater flow from the Grace property toward the UniFirst property in response to current pumping from UniFirst well UC22.*

It is important to clarify that USEPA appears to have drawn the "natural" or non-pumping groundwater flow directions based on the measured hydraulic heads or water levels collected from the dozens of monitoring wells used to create the equipotential lines shown on USEPA's two figures. It appears that the USEPA-drawn natural groundwater flow directions are based on Figure 3-19 of the Wells G&H Site Central Area Remedial Investigation Phase 1A Report (GeoTrans and RETEC, 1994) which was an estimated December 4, 1985 water-table map for the Wells G&H Site. Drawing groundwater flow lines based on such data not only is standard accepted practice; it also accurately reflects regional groundwater flow directions based on a comprehensive synoptic round of water level measurements from a large number of monitoring points. UniFirst and Grace therefore agree with the representation of non-pumping groundwater flow lines shown on the USEPA figures.

By contrast, the dashed groundwater flow lines that USEPA drew on both figures to represent "potential influence on groundwater" from the former production wells are not based on any measured hydraulic heads or equipotential lines and are only speculative. In fact, based on our discussion with USEPA at the January 21, 2010, meeting, we now understand that the schematic groundwater flow lines that USEPA drew were provided largely for purposes of hypothetical illustration and were never intended to represent actual flow directions based on any data.

In the early stages of the comprehensive site investigation undertaken at the Wells G&H Site, studies were conducted to evaluate the potential effects of historical pumping on contaminant migration. Data and historical information collected from the previously completed investigation are at odds with the schematic representation of groundwater flow shown on USEPA's figures. Data collected, for example, from pumping tests conducted at public supply Wells G&H and the NEP production well do not support the groundwater flow directions that USEPA has projected, in either shallow unconsolidated deposits or bedrock.

The effects of pumping at Wells G&H were rigorously evaluated by the USGS on behalf of USEPA during a 30-day pumping test conducted between December 4, 198,5 and January 3, 1986. Wells G&H were pumped at a combined rate of 1,100 gpm (700 and 400 gpm from Wells G and H, respectively), which was similar to reported maximum pumping rates. During the 30-day pumping test, water-level monitoring was performed at 127 observation wells and 10 stream bed piezometers. The USGS concluded from the 30-day pumping test that the zone of contribution to Wells G&H consisted of the Aberjona Valley aquifer surrounding the pumping wells, considerable induced infiltration from the overlying wetlands and Aberjona River, and the area of the Aberjona watershed upgradient of the area of influence. ***No measurable effects of pumping were measured in unconsolidated deposits or bedrock 500 feet east of Wells G&H.*** *That is, the zone of influence of those wells did not extend beyond 500 feet east of Wells G&H, and groundwater flow directions beneath the Dewey Avenue neighborhood and West Cummings Park were not affected by pumping. The*

USGS further concluded that the 30-day pumping test zone of influence was a "snapshot" that was representative of an average zone of influence for those two wells.

In October 1988, NEP conducted a 72-hour pumping test at a rate of 16 gpm in a 500-foot deep bedrock extraction well on the property, NEP-2. Approximately 200 feet of water-level change was reported for that production well due to pumping. During this pumping test, the maximum water-level changes in bedrock monitoring wells on the NEP property north of the production well were approximately 1.0 foot or less (1.15 feet in NEP-101B, 0.87 feet in NEP-108, and 0.98 feet in NEP-102B). The greatest response in bedrock to pumping NEP-2 was measured on the NEP property to the east at NEP-107B where 7.53 feet of water-level change was recorded.

The reported NEP water discharge permit was 12 gpm; therefore, actual historical water-level drawdown on the NEP property during normal production well use was presumably less than that recorded during the 72-hour pumping test. More importantly relative to USEPA's apparent concern that NEP bedrock pumping may have impacted unconsolidated deposits groundwater flow in the Dewey Avenue neighborhood, considerably less water-level change was measured in unconsolidated deposit wells on the NEP property during the 72-hour bedrock pumping test than was measured in the NEP bedrock wells. In unconsolidated deposit wells north of NEP-2, only 0.12 and 0.02 feet of water-level change was measured at wells NEP-101 and NEP-102, respectively. In addition, unconsolidated deposit well NEP-104, located less than 150 feet from the pumping well, recorded a water-level change of only 0.21 feet.

The Dewey Avenue neighborhood is located approximately 3,000 feet north of the NEP property. The small water-level changes observed in unconsolidated deposit monitoring wells and in bedrock monitoring wells to the north on the NEP property demonstrate that there would be no noticeable effect on shallow groundwater flow directions in the Dewey Avenue neighborhood in response to pumping NEP deep bedrock production wells.

No pumping test or water-level data were collected specifically for the purpose of evaluating historical pumping effects from the Johnson Brothers well. However, historical information collected earlier in the site investigation indicates that the Johnson Brothers well was not a major supply well. As stated in comments that GeoTrans, Inc. provided to USEPA on behalf of Grace in 1987 (GeoTrans, Review of EPA Report Titled "Wells G & H Site Remedial Investigation Report Part 1, Woburn, Massachusetts"), "[T]he well was 300 ft. deep and was used by Johnson Brothers at an average rate of 5.2 gpm (Personal communication, Gerry Bunker, Johnson Brothers, 1986)." The well had to be drilled to 300 feet in order to attain the reported yield, indicating that the average hydraulic conductivity of the bedrock at that location was quite low. In fact, records from the Woburn Department of Public Works show that, only a few years after the well was installed, Johnson Brothers obtained and then upgraded a connection to the public water supply system. Johnson Brothers drew much of the water that it needed from the public water supply system, not its small production well. Finally, Johnson Brothers ceased all operations at least as early as July 1, 1977, when it conveyed its property to the W.S. Cummings Realty Trust. In summary, any effects this well would have had on groundwater flow directions prior to 1977 would have been minimal and, in any event, would no longer be present now, 33 years later.

Therefore, historic site data and data analyses demonstrate that pumping from former City of Woburn public supply Wells G&H and from private bedrock water supply wells south of Dewey Avenue would not have had a significant or, more likely, any effect on lateral flow of shallow groundwater beneath the Dewey Avenue neighborhood.

Despite these facts, solely for reaching an accommodation with USEPA on groundwater sampling locations for the VIA, UniFirst and Grace revised the VIA Work Plan to provide additional monitoring of shallow groundwater in the Dewey Avenue neighborhood. In particular, on January 27, 2010, UniFirst and Grace proposed four additional shallow wells be installed in the Dewey Avenue neighborhood, and existing shallow wells K60S and K55S will be included in the VIA Work Plan. On February 2, 2010, USEPA made additional modifications to the locations of two wells, and confirmed acceptance of the number and locations of the remaining monitoring wells, as shown in the Revised VIA Work Plan.

4) **Page 2-1, Section 2.1.** Rotosonic drilling techniques were applied by W.R. Grace during their RW22 Area investigation. During recent meetings with W.R. Grace representatives, it was suggested that such drilling techniques tend to heat up and volatilize contaminants within the soils. These techniques may not be the most appropriate for characterizing soil subsurface conditions, such as the case with the RW22 Area Investigation, where VOCs concentrations from soil boring samples were relatively low. The applications of rotosonic drilling techniques for establishing a monitoring well for future groundwater sampling purposes appears reasonable considering the dense, hard pact nature of the subsurface till. EPA understands that such techniques will volatilize soil contaminants within the augur/boring and PID readings and grab samples from cuttings would not be representative of subsoil conditions.

Response: *The locations of the screened intervals for the proposed wells will be selected based on the depth of the water table only. Thus, whether or not the drilling technique used may potentially volatilize soil contaminants is immaterial. Regardless of the drilling technique used, the soil cores would become heated, because of the very dense nature of the deposits.*

5) **Section 2.2, Well Integrity.** Existing wells (GO1S, S21, S22, S81S and S63S) not screened across the current water table and with insufficient integrity will need to be restored to working order or replaced and kept in the sampling program.

Response: *As shown in the table below, the existing wells listed above are either screened across the water table or very near to it.*

Well	*TOS Elevation*	*BOS Elevation*	*Water Level Elevation*
GO1S	*65.2*	*55.2*	*59.5*
S21	*73.7*	*46.2*	*60.2 – 57.1*
S22	*81*	*41*	*75.4-65.6*
S81S	*44.7*	*34.7*	*52.4*
S63S	*58*	*48*	*58.6*
The water level elevations for GO1S, S63S, and S81S were measured in April 2009. *The water level elevations for S21 and S22 represent the range of elevations measured during the 1991 pilot test.* *TOS – Top of Screen; BOS – Bottom of Screen*			

The five wells listed above were included in the VIA sampling because they already exist. The integrity of these wells will be tested using the methodology described in the attached QAPP prior to sampling. If for some reason one or more of these wells cannot be sampled, they will not be replaced at this time. Following an evaluation of the results of the VIA sampling, a determination will be made as to the need for additional sampling, if any. Additional work may or may not involve these monitoring wells.

6) **Section 2.3, Water level monitoring.** Conduct water level monitoring in the shallow existing UniFirst and W.R. Grace wells at the same time the new neighborhood wells are monitored. Determine and prepare a shallow contemporaneous groundwater contour map across the entire area

Response: *The new monitoring wells installed as part of the VIA work will be included in the annual water level monitoring round to provide a shallow contemporaneous groundwater contour map across the entire area.*

7) **Section 2.3, Passive Diffusion Bag (PDB) Sampling.**

- **Representativeness.** The text suggested that diffusion samplers would be deployed at a depth up to one foot below the water table. The diffusion sampler may be in place for a three week period or longer. It is recommended that diffusion samplers, and any other deployed sampling device, be consistently located within a vertical elevation that will receive free flowing groundwater from the adjacent well screen close to the water table without concern for water table fluctuations where the water level may drop and partially expose the sampling device to non-free flowing conditions and/or air. It is suggested that the diffusion bag samplers be situated at a greater depth below the water table so the samples remain within the free flowing groundwater conditions by the water table (e.g., 2'-3' below the water table). The vertical location of the sampling device should be consistently applied to monitoring wells throughout the study area.

  Otherwise, deploying the PDB within the top foot of the groundwater table may lead to a result that is biased low. With the sampler installed close to the water surface, over the two to three week period wherein the sampler is deployed, the water table may fall below the installation depth of the PDB, potentially exposing the sampler to the air within the well casing. In addition, the water at that depth may be equilibrated with column of air within the well, rather than the reduced pore area of the adjacent formation. The PDB should be installed at a depth that guards against water table fluctuations and localized air/water equilibrium affects. If a sampler is to be installed within the top foot of the water column, then additional PDB samplers should be deployed below the sampler to evaluate potential concentration bias. Please apply the USGS's "User's Guide for Polyethylene-Based Passive Diffusion Samplers to Obtain Volatile Organic Compound Concentrations in Wells" for the proposed VI SOW groundwater sampling program. A copy of the USGS user guide can be found at the following link - http://costperformance.org/pdf/wrir014060.pdf

- **Proximity to screen interval.** Provide a table that summarizes the wells proposed for sampling, surface elevation (where installed), measured groundwater elevation range, screen interval elevations, and formation screened. Also indicated the proposed installation elevation of the PDB sampler. Following the proposed installation scheme, if the PDB becomes located above the screened interval (in the potentially stagnant water column), then the depth of PDB placement should be adjusted to have the PDB placed within the screened interval where groundwater freely flows through the screen.

  Response: *Given USEPA's expressed concerns, groundwater samples will be collected using the low-flow sampling methodology described in the attached QAPP. The pump intake will be located within the well screen, approximately two feet below the water level in the well and at least one foot below the top of the well screen. The groundwater sample collection standard operating procedure in the QAPP contains a contingency to collect samples using a bailer in the case where the well yield is insufficient to collect a sample using the low-flow sampling method.*

8) **Page 2-2, Section 2.3.** The snap sampler web page states, "Academic research, EPA, and ASTM guidance indicates flow-through in the well screen is normal and usual. In most circumstances, truly "stagnant" water is present only in blank well casing above the screen. The screen interval inside the well normally contains free flowing formation water." According to the Interstate Technology Regulatory Council, Passive Diffusion Bag (PDB) samplers "rely on the free movement of groundwater from the aquifer or water bearing zone through the well screen." Please inventory and identify the vertical elevation of the well screen, water table and the elevation the proposed sample will be collected from. Please ensure that all samples are collected from free flowing water and representative of current aquifer conditions. If the sample is collected from a location above the well screen, then the sample may not be representative of free flowing water from the aquifer by the water table. For these locations, it may be appropriate to install new monitoring wells.

Response: *Groundwater samples will be collected using the low-flow sampling method. See response to Comment 7 above.*

9) **Section 2.3 and Section 3 - Chemicals of Concern.** Section 3 suggests a limited suite of compounds for evaluation as part of this effort. Note that the following volatile organic compounds have been detected in UniFirst monitoring wells and warrant consideration:
   - 1,1,2,2-tetrachloroethane
   - 1,1,2-trichloroethane
   - 1,1-dichloroethene
   - 1,2,4-trimethylbenzene
   - 1,2-dibromoethane
   - 1,2-dichloropropene
   - 1,3,5-trimethylbenzene
   - 2-butanone
   - 2-hexanone
   - 4-methyl-2-pentanone
   - acetone
   - benzene
   - bromoform
   - bromomethane
   - carbon disulfide
   - carbon tetrachloride
   - chlorobenzene
   - chloroethane
   - dibromochloromethane
   - ethylbenzene
   - isopropylbenzene
   - meta- & para-xylenes
   - ortho-xylene
   - xylenes (total)
   - methylene chloride
   - n-propylbenzene
   - styrene
   - toluene
   - trans-1,3-dichloropropene

   In addition the following volatile organic compounds have been detected in W.R. Grace monitoring wells and warrant consideration:
   - 1,2-dichloropropane

- bromodichloromethane
- naphthalene
- tetrahydrofuran
- 1,2-dichlorobenzene
- 1,3-dichlorobenzene
- 1,4-dichlorobenzene

Response: *The list of analytes for the VIA has been revised. A revised analyte list was sent to USEPA on February 17, 2010 and was modified and approved by USEPA in a letter dated February 25, 2010. The attached revised Work Plan and QAPP reflect the final analyte list. During a phone conversation on March 8, 2010, USEPA indicated that the analyte 1,2-Dichloropropene listed in USEPA's February 25, 2010 letter was a typographical error and that this analyte does not need to be evaluated..*

The final VIA analyte list includes all VOCs where the maximum concentration detected in groundwater samples collected historically from UniFirst and Grace wells exceeded the "Groundwater VI Screening Criteria" proposed in USEPA's February 25, 2010 letter, or where the detection limit for an analyte exceeded the "Groundwater VI Screening Criteria". Responses to USEPA's proposed Groundwater VI Screening Criteria are provided below in response to Comment 13.

10) **Section 2.3 and Section 3 - 1,4-Dioxane.** Include 1,4-dioxane in the list of analytes for groundwater due to the elevated levels and historical releases of 1,1,1-trichloroethane at the nearby properties (e.g., UniFirst) and potential presence of 1,4-dioxane as a stabilizer in commercially available 1,1,1-trichloroethane. Section 2.3 of the Work Plan indicates that analyses will be performed as per Section 6 of the Long-Term Monitoring Plan (LTMP) provided in Appendix A; however, 1,4-dioxane is not on the list of volatile organic compounds (VOCs) in Table 6-2 of the LTMP.

Response: *We do not agree that 1,4-dioxane should be included in the list of analytes for the VIA work. 1,4-Dioxane has a very low Henry's Constant and is miscible in water. As a result, 1,4-dioxane partitions to the water-phase and not the air-phase, and is unlikely to form a vapor plume in the vadose zone above a dissolved-phase plume (CLU-IN web site). It does not pose a vapor intrusion concern. In addition, 1,4-Dioxane is not a "compound of interest" on the vapor intrusion Screening Levels table included in Comment 13. Therefore, this constituent will not be added to the groundwater analyte list for the VIA work.*

11) **Section 2.3, 2.4 and 3 - Quantitation Limits.** The VOC groundwater analyses by 8260B specified in Section 6 of the LTMP will not be satisfactory to achieve EPA's VI Screening criteria (provided herein). As per Section 6, Table 6-2, the Quantitation Limit (QL) for most VOCs is 2 micrograms per liter (ug/L); therefore, 8260B analysis using selective ion monitoring (SIM) will be needed for trans-1,2-dichloroethene, 1,2-dichloroethane, chloroform, vinyl chloride, and tetrachloroethene.

Response: *The analytical method and target quantitation limits for specific analytes are specified in the attached QAPP. Samples will be analyzed using EPA Method 8260B, with SIM where necessary and possible to achieve applicable reporting limits.*

12) **Section 2.4, Data Validation.** The description provided in Section 2.4 of the Work Plan on Groundwater Data Tier I Validation is confusing and requires additional clarification as set forth below:
    - Clarify what is meant by "enhanced Tier 1 data validation".

- Specify what Quality Control (QC) parameters will be assessed during data validation.
- Describe what final product will be produced by the data validation effort.
- Specify the validation guidelines proposed to be followed.
- Section 11 of the LTMP (which is referenced in Section 2.4 of the Work Plan) refers to out of date National Functional Guidelines. The current EPA Region 1 data validation guidelines are appropriate for this work. The laboratory must document and report recoveries for surrogates and matrix spikes.

Response: *A Region 1 Tier III data validation will be applied to the data. Data validation methodology details are provided in the attached QAPP.*

13) **Section 3, Data Evaluation and Table 3-1.**

➢ **Screening Levels.** The use of Massachusetts Contingency Plan (MCP) Method 1 GW-2 groundwater cleanup standards for vapor intrusion (VI) screening is not acceptable. EPA vapor intrusion screening criteria are based upon an Incremental Life Cancer Risk (ILCR) of 1E-06 and Hazard Quotient (HQ) of 0.1. The table provided below includes the VI Screening Criteria (ug/L) for each volatile organic compound (VOC) of interest based upon ILCR equivalent to 1E-06 or HQ equivalent to 0.1, which shall be used for this initial vapor intrusion study. Selective Ion Monitoring (SIM) analysis will most likely be required for trans-1,2-dichloroethene, 1,2-dichloroethane, chloroform, vinyl chloride, and tetrachloroethene to achieve the tabulated VI Screening Criteria.

Compound of Interest	Indoor Air VI Screening Criteria (ug/m^3)	Basis of Screening Criteria	Groundwater VI Screening Criteria (ug/L)	Basis of Screening Criteria
Chloroform 1.1E-01		ILCR = 1E-06	0.705 ILCR	= 1E-06
1,1-Dichloroethane 1.5E+00		ILCR = 1E-06	6.61 ILCR	= 1E-06
1,2-Dichloroethane 9.4E-02		ILCR = 1E-06	2.34 ILCR	= 1E-06
1,1-Dichloroethene	2.1E+01	HQ = 0.1	19	HQ = 0.1
Tetrachloroethene 4.1E-01		ILCR = 1E-06	0.55 ILCR	= 1E-06
Trichloroethene 1.2E+00		ILCR = 1E-06	2.89 ILCR	= 1E-06
Vinyl chloride	1.6E-01	ILCR = 1E-06	0.32 ILCR	= 1E-06
trans-1,2-Dichloroethene	6.3E+00	HQ = 0.1	18	HQ = 0.1
cis-1,2-Dichloroethene	No value available		21	HQ = 0.1
1,1,1-Trichloroethane	5.2E+02	HQ = 0.1	310	HQ = 0.1
Methylene chloride	5.2E+00	ILCR = 1E-06	58 ILCR	= 1E-06
2-Butanone	5.2E+02	HQ = 0.1	44,000	HQ = 0.1
Acetone	3.2E+03	HQ = 0.1	22,000	HQ = 0.1
Carbon tetrachloride	1.6E-01	ILCR =	0.135	ILCR =

		1E-06 1E-06		
Carbon disulfide	7.3E+01	HQ = 0.1	56	HQ = 0.1
Xylenes	1E+01	HQ = 0.1	2,200	HQ = 0.1
Toluene	5.2E+02	HQ = 0.1	150	HQ = 0.1
Chlorobenzene	5.2E+00	HQ = 0.1	39	HQ = 0.1
Styrene	1.0E+02	HQ = 0.1	890	HQ = 0.1
1,1,2,2-Tetrachloroethane	4.2E-02 ILCR = 1E-06		3 ILCR	= 1E-06
1,2-Dichloropropane 2.4E-01		ILCR = 1E-06	2.12 ILCR	= 1E-06
n-Propylbenzene No	value available		32	HQ = 0.1
1,1,2-Trichloroethane 1.5E-01		ILCR = 1E-06	4.11 ILCR	= 1E-06
1,2,4-Trimethylbenzene	0.73	HQ = 0.1	2.4	HQ = 0.1
1,3,5-Trimethylbenzene	0.63	HQ = 0.1	2.5	HQ = 0.1
1,2-Dibromoethane 4.1E-03		ILCR = 1E-06	0.36 ILCR	= 1E-06
1,2-Dichloropropene No	value available	No	value available	
2-Hexanone	3.1E+00	HQ = 0.1	787	HQ = 0.1
4-Methyl-2-pentanone	3.1E+02	HQ = 0.1	1,400	HQ = 0.1
Benzene 3.1E-01		ILCR = 1E-06	1.36 ILCR	= 1E-06
Bromoform 2.2E+00		ILCR = 1E-06	0.0083 ILCR	= 1E-06
Bromomethane	5.2E-01	HQ = 0.1	2	HQ = 0.1
Chloroethane	1E+03	HQ = 0.1	2,800	HQ = 0.1
Dibromochloromethane 9E-02		ILCR = 1E-06	3.2 ILCR	= 1E-06
Ethylbenzene 9.7E-01		ILCR = 1E-06	3.04 ILCR	= 1E-06
Isopropylbenzene	4.2E+01	HQ = 0.1	0.84	HQ = 0.1
trans-1,3-Dichloropropene	No value available	0.84		ILCR = 1E-06
Naphthalene 7.2E-02		ILCR = 1E-06	3.98 ILCR	= 1E-06
1,2-Dichlorobenzene	2.1E+01	HQ = 0.1	260	HQ = 0.1
1,3-Dichlorobenzene No	value available	No	value available	
1,4-Dichlorobenzene 2.2E-01		ILCR = 1E-06	2.25 ILCR	= 1E-06
Tetrahydrofuran No	value available	No	value available	
Bromodichloromethane 6.6E-02		ILCR = 1E-06	2.1 ILCR	= 1E-06

Notes:
ug/L – microgram per liter
ILCR – Incremental Lifetime Cancer Risk
HQ – Hazard Quotient

Response: *Screening Criteria have changed based on the February 25, 2010 EPA comments on the February 1, 2010 UniFirst VIA Work Plan.*

UniFirst and Grace disagree with the Screening Criteria and list of analytes proposed by USEPA. The attached memorandum prepared by Brian Magee of ARCADIS-US points out many of the problems with USEPA's proposed Screening Criteria. In order to expedite resolution of analytical and sampling issues for the VIA, UniFirst and Grace have agreed to establish analytes and detection limits that meet USEPA's stated data quality objectives. However this should be in no way be construed as an agreement to the principles contested in the attached memorandum.

14) **Section 3, Screening Levels.** Detection limits for groundwater contained in the 2002 LTMP do not appear low enough for some compounds to adequately evaluate whether the vapor intrusion pathway is complete. Evaluate and adjust, as needed, analytical procedures to attain sufficiently low laboratory reporting limits. See above comment # 11 regarding 8260B analysis using selective ion monitoring (SIM) for trans-1,2-dichloroethene, 1,2-dichloroethane, chloroform, vinyl chloride, and tetrachloroethene. See also above comment # 13 and the vapor intrusion screening criteria table for groundwater and air. Note: For compounds on the table where "no value available" is denoted, their detection limits for groundwater samples should be 0.5 ug/L.

Response: *See responses to Comments 11 and 13 above. The analytical method and target quantitation limits for target groundwater analytes are specified in the attached QAPP.*

15) **Section 3.** The parties will coordinate directly with EPA regarding possible next steps for further assessing potential vapor intrusion migration pathways, if necessary, including additional monitoring wells, sub-slab soil gas sampling, and indoor air sampling. All validated data shall be provided to EPA in excel/ access data base form (form 1 electronic tables).

Response: *Grace and UniFirst will coordinate with USEPA. Validated data will be provided to USEPA in Excel/Access database format.*

Based on discussions at the January 21, 2010 meeting and intervening correspondence, the parties appear to be in agreement that a work plan that includes one round of groundwater sampling at the locations indicated on Figure 1 (attached) that is coordinated with the annual sampling event for the UniFirst and Grace properties, along with a second round of sampling from the off-site VIA wells, meets the project objectives. Coordination of a VIA sampling event with the annual sampling event for the Grace and UniFirst properties requires that the requisite work plans, QAPPs, and other project documents are approved by USEPA as needed to meet that schedule. Other than indoor air and sub-slab vapor testing being conducted separately by UniFirst, at this time UniFirst and Grace do not anticipate that any additional work will be required.

16) **Section 3.** Please include a Quality Assurance Project Plan (QAPP) and relevant Standard Operating Procedures for the WP.

Response: *A QAPP and relevant SOPs for the VIA work are attached, along with the revised Work Plan.*

17) **Page 4-1, Section 4.** The schedule should reflect monitoring well installation in the winter or earlier, so that the UniFirst sub-slab soil gas, indoor air and shallow groundwater samples can be coordinated and collected while the ground is under frozen conditions in the winter season. As identified in EPA's comments to the UniFirst Vapor Intrusion Scope of Work, two rounds of

sampling shall be necessary due to considerable seasonal variability with soil gas, indoor air and groundwater results. The initial sub-slab soil gas and indoor air samples should be collected at the UniFirst property during winter conditions (i.e., frozen ground) in February 2010, while the second round of sampling is scheduled during summer conditions around August 2010. Shallow groundwater level measurements and sampling shall occur within a few weeks after the sub-slab and indoor air sampling has been completed at the UniFirst and W.R. Grace source area properties, as well as downgradient/ near the UniFirst and W.R. Grace properties.

Response: *UniFirst has submitted to USEPA a work plan and proposed schedule for completing the vapor intrusion and indoor air quality assessment on the UniFirst property. Scheduling of water-level measurement and groundwater sampling under this Work Plan will be coordinated with water-level measurement and groundwater sampling on the UniFirst property and sampling conducted under the annual groundwater monitoring plan. As discussed at the January 21, 2010 meeting with USEPA, conducting the first round of sampling in February 2010 was not possible given the exchange of information and approvals that needed to be obtained prior to initiating sampling. We propose to install the new shallow groundwater wells in spring 2010 and collect the first round of groundwater samples two weeks after the new shallow groundwater wells are installed. The first round of VIA sampling is planned to coincide with the annual Northeast Quadrant groundwater sampling event, if possible, which includes sampling of the wells on the UniFirst and Grace properties. The second round of groundwater sampling will occur approximately six months later.*

18) **Page 4-1, Section 4.** Please coordinate directly with EPA and its oversight contractor, TRC, regarding the field schedule of all activities including assessment of existing monitoring wells (prior to the initiation of field work).

Response: *USEPA and its oversight contractor, TRC, will be kept informed of the field work schedule related to the VIA activities.*

Please contact Tim Cosgrave or Clayton Smith if you have any questions regarding this letter or the attachments.

Sincerely,

Jonathan R. Bridge
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